Gemmology DU : DUG 2023-2024

Faculté des sciences
et des techniques

Nantes Université | Pôle Sciences et technologie

Training program - Syllabus

Objectives	The aim of the course is to go beyond traditional gemmology degrees that use simple methods with small instruments. This course offers a specialisation in gemmological expertise, in particular the detection of synthetics and treatments. Training in analytical methods, previously reserved for laboratories, is therefore proposed, as a complement to the classical gemmology diploma the candidate already has. Mastering the bases of laboratory gemmology is demonstrated by using such instruments to undertake an experimental gemmological research project. After final exams, this experimental report will be defended in from of a jury to obtain the University Diploma in Gemmology.
Public/Prerequisite	Gemologists and gemology enthusiasts Hold a diploma in classical gemmology, for example Graduate Gemologist , or diplomas from GemA, or the Federation of European Education in Gemology (FEEG) , or an equivalent title
Career opportunities	- Expert or appraiser (auction houses, insurance companies, courts, customs, etc.) - Laboratory gemologist - Broker, specialized buyer
Duration	210 hours - (2 x 3 weeks)
Dates	March 25th to April 12th –May 13th to June 3d 2024 (cf schedule)
Number of students	11 to 16 trainees
Venue	The course is held at the Faculty of Sciences, Nantes University (UFR Sciences et Techniques) and laboratory sessions at Institut des Matériaux Jean Rouxel à Nantes (IMN-CNRS).
Price	6825,00 € net
Pedagogy	Course with practical advice. Practical laboratory work, with the use of a number of instruments found in gemmology laboratories (e.g. spectrometers, chemical analyses, microscopes) Studies of reference gems from the education and research collection. The diploma is being hybridised, with a part available via a server, notably documents to be studied remotely via the Madoc platform
Pedagogical support	Course director: Emmanuel Fritsch - Professor of Physics & gemmologist - Institut des Matériaux Jean Rouxel (IMN) Nantes
Methods of evaluation	Continuous assessment (5 "quizzes", half practical and half theoretical) Final exams : one practical (case study), one theoretical (questions on the courses), and two reports. The bibliographic report is due in week 4, the experimental report is defended publicly, at an imposed date several months after the course period.

Administrative follow up	Service Formation Continue et Alternance (FOCAL) U.F.R. Sciences et Techniques 2, rue de la Houssinière BP 92208 44322 Nantes Cedex 3 Contact : Sabine DRUBAY 02 51 12 53 92 sabine.drubay@univ-nantes.fr Attendance sheets are signed by the trainees each day. A certificate of completion is given to trainees at the end of the course.
Type of validation	Diplôme Universitaire (University diploma)

Training organization	NANTES UNIVERSITE – Pôle Sciences et technologie Faculté des Sciences & des Techniques Service Formation Continue et Alternance 2 rue de la Houssinière – BP 92208 – 44 322 Nantes Cedex 3 Code APE : 8542Z SIRET : 130 029 747 001 15 Declaration of activity registered under n° 52 44 09582 44 with the Préfet de Région des Pays de la Loire. Legal status : EPSCP

Teaching units

	Présentiel
Radiation - gem Interaction Spectroscopy notions Spectra under Excel	**9H20**
Stages of a project / writing a report Bibliography Worksheet Practical advice for writing Which method for which problem	**4H00**
Chemistry basics	**1H20**
Electron microscopies (SEM-TEM)	**2h40**
Sample preparation SEM sample/slide cleaning	**5h20 lab**
UV-Visible-Near Infrared absorption spectroscopy	**2H40 +4 h lab**
Origin of color Colorimetry	**4H** **1H20 + 2h40 lab**
Cristallography Practical cristallography: wooden models and rough	**6H40** **2H40 lab**
Vibrational spectroscopies Intro Infrared spectroscopy Raman spectroscopy	**8H** **5H20 lab**
Chemical analysis by energy dispersion (X-ray fluorescence, EDS, etc.) Electron microprobe ICPMS-LA and other mass spectrometries, ion probes, isotopic measurements, etc.)	**9H20**
Photography and micrography	**1H20**
Luminescence techniques Spectrofluorometry - origin of luminescence	**4H00** **+4H lab**

Synthetic HPHT/CVD diamonds Diamond morphology Moissanite	**8H**
Geology of gems Introduction to geology diamond - carbonado, corundum (rubies, sapphires), beryl (emerald) Pegmatites other gems: Garnet, Opal, Jade, etc. Fluid inclusions Tp gitology samples	**18H** **+ 1H20 lab**
Heat treatment Treatment by irradiation	**5h20**
X-ray diffraction and topography	**2H40**
Natural coloured diamonds Colour treated diamonds (except HPHT) HPHT treated diamonds	**6H40**
Natural and induced radioactivity	**2H40**
Crystal growth	**2H40**
Pearls: varieties, formation & identification	**6H40**
B jade	**1H20**
Practical work, adapted to the experimental subject: SEM (+EDS), Optical spectroscopies : UV-Visible-Near Infrared, infrared absorption, Raman scattering, spectrofluorimetry Classical gemmology, photography of samples	**61H**
First contact Determination of the reports topics Laboratory/expertise approach Preparation experimental report Preparation for practical exam	**13h20 + 1h20 lab**
TOTAL HOURS :	**210 H**

Teaching staff

University faculty :

- Emmanuel Fritsch - Physics professor, GG hFGA , Institut des Matériaux Jean Rouxel (I.M.N.) Nantes

- Camille Latouche – Associate professor, chemistry. Institut des Matériaux Jean Rouxel (I.M.N.) Nantes

Enseignants issus du monde socio-économique :

- Franck Notari : Director - GGTL- Genève, Suisse.

- Dr. Stefanos Karampelas **:** Chief gemologist, Head of laboratory section – LFG, Paris

- Dr. Boris Chauviré : General Director in charge of Innovation and Education - Géogems Guérande

Service Formation Continue et Alternance
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